

**Voltage amplitude multiplying circuits**Patent Number: ☐ US4000412Publication  
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JP1022871C, JP1130300C, ☐ JP51007444, ☐ JP51010325, JP55003898B, JP57018423B**Abstract**

Circuits for generating pulsating potentials and voltage levels outside the range of, and/or of greater magnitude than, the operating potential applied to the circuits. Each circuit includes first and second transistors for applying a first voltage to one plate of a capacitor and a second voltage to the other plate of the capacitor, during one time interval. During a subsequent time interval, the first and second transistors are turned off and a third transistor applies the second potential to the one plate of the capacitor. The change in the potential at the one plate of the capacitor is coupled to the other plate of the capacitor at which is produced an output potential outside the range of the first and second voltages. The potential difference between the first voltage and the output potential is greater in amplitude than the potential difference between the first and second voltages. The circuit may also include means alternately applying the first voltage and then the output potential to an output point for generating pulsating signals of greater amplitude than the magnitude of the applied potential. The outputs of two or more circuits may be combined to produce direct current (d.c.) levels. Also included are circuits which operate from a pulsating source of operating potential.

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[54] **VOLTAGE AMPLITUDE MULTIPLYING CIRCUITS**

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[30] **Foreign Application Priority Data**

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[58] Field of Search ..... 307/108, 109, 110, 246, 307/264, 269, 296 R, 296 A, 279, 208, DIG. 1, 240, 251; 320/1

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[57]

**ABSTRACT**

Circuits for generating pulsating potentials and voltage levels outside the range of, and/or of greater magnitude than, the operating potential applied to the circuits. Each circuit includes first and second transistors for applying a first voltage to one plate of a capacitor and a second voltage to the other plate of the capacitor, during one time interval. During a subsequent time interval, the first and second transistors are turned off and a third transistor applies the second potential to the one plate of the capacitor. The change in the potential at the one plate of the capacitor is coupled to the other plate of the capacitor at which is produced an output potential outside the range of the first and second voltages. The potential difference between the first voltage and the output potential is greater in amplitude than the potential difference between the first and second voltages. The circuit may also include means alternately applying the first voltage and then the output potential to an output point for generating pulsating signals of greater amplitude than the magnitude of the applied potential. The outputs of two or more circuits may be combined to produce direct current (d.c.) levels. Also included are circuits which operate from a pulsating source of operating potential.

22 Claims, 9 Drawing Figures

